

[0135] **Historical Data.** A continuous historical archive of most TSAF data is maintained by associating a begin date and end date to each item, where the dates indicate the period of time during which a piece of data was current. In the property tables in the following sections, the notation “Historical” indicates that a historical archive is maintained for the values of the indicated property.

5 Each table that is used to maintain historical data must include begin date and end date columns to indicate the period during which each row of the table is valid. If an end date is null, then the valid period is any time on or after the specified begin date; otherwise, the valid period is any time on or after the specified begin date, but before the specified end date.

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[0136] **Dynamic Segmentation.** Dynamic segmentation of an Anchor Section means that the Section can be dynamically and virtually segmented by creating interior intersections or multiple varying properties associated with portions of the Anchor Section without forcing the section to be segmented into multiple sections, where each new section would have the new property or intersection associated with it. For linear objects, some properties vary along the length of that object (linear properties) and others occur at a specific point along that object (point properties). For example, the through lane count may vary along a Division Section. If dynamic segmentation is allowed for an object, then the object has a property that indicates as such in its property table. Each table that is used to maintain linear dynamic segmentation data has an ID column identifying the object to which a row in the table applies, a “begin percent”

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column indicating the position along that object (expressed as a percentage of the total length) at which the row begins to apply, and an “end percent” column indicating the position along that object (expressed as a percentage of the total length) at which the row ceases to apply. Each table that is used to maintain point dynamic segmentation data has an ID column and a percent column indicating the position at which that property occurs.

The Entity-Attribute Data Model

[0137] The primary goal of the exemplary embodiment is to maintain and facilitate access to data that describes a road network. This data can be placed into three broad categories: (1) road network data, which defines the roads, (2) road characteristic data, which defines characteristics of the road (e.g., pavement type), and (3) other data, which may or may not be associated with positions in the road network. In order to help automate processing and maintenance of this data and to simplify user access to this data, an object-oriented view of all data is implemented. For example, pavement type data is associated with the road object. The Entity-Attribute Data Model (see Figure 13), as discussed above, specifies the details of how this object-oriented view of data is implemented.

[0138] In addition to the definition of Entities and Attributes as defined in the system and method, the definition of relationships between Entities is also defined. For example, the “county” Entity is related to “road section” Entities because each road section has a county attribute indicating the county in which that road section is

located. Then, the fundamental elements of system and method data are the Entity, the Attribute, and the Entity relationship.

- [0139] Referring now to Figure 14, there is shown the Attribute Table structure. An Attribute is a data value that is associated with a specific Entity. For example, the weight limit of a bridge is an Attribute that is associated with a bridge Entity. Three (3) primary types of Attributes are supported by the model. An historical Entity Attribute 1410 and 1440, like the bridge weight limit, is a value that applies to an entire Entity and that may vary over time. A static Entity Attribute 1420 and 1450 is a value that applies to an entire Entity and that applies during the entire life of that Entity. A dynamic segmentation Attribute 1430, on the other hand, applies to only a sub-section of a linear Entity. In the exemplary embodiment, dynamic segmentation Attributes only apply to the Division Section and Road Section Entities.
- Note that static Entity Attributes 1420 can be stored in the same table that defines the Entity, but historical Entity Attributes 1410 and dynamic segmentation Attributes 1430 must be stored in different tables. An historical Entity Attribute 1440 of a linear Entity 1450, like the length of an Anchor Section, is a value that applies to an entire linear Entity and that may vary over time. A static Entity Attribute of a linear Entity 1450 is a value that applies to an entire linear Entity and applies during the entire life of that Entity.
- [0140] In addition to the two primary types of Attributes, which define the basic table structure used for storing Attribute data, a number of other factors can influence how Attribute data is stored and maintained in the system. For example,